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10/796,149	03/10/2004	Makoto Shizukuishi	0649-0948P	2035

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EXAMINER	
NGUYEN, LUONG TRUNG	
ART UNIT	PAPER NUMBER
2622	

NOTIFICATION DATE	DELIVERY MODE
05/11/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/796,149	SHIZUKUISHI, MAKOTO	
	Examiner	Art Unit	
	LUONG T. NGUYEN	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 February 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) *5,6,10,11,13,14,16,17 and 19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,9 and 12* is/are rejected.

7)☒ Claim(s) *7-8,15,18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species II, illustrated in Figures 10-15, which reads on claims 1-4, 7-9, 12, 15 and 18 in the reply filed on 1/08/2008 is acknowledged.

2. Claims 5-6, 10-11, 13-14, 16-17 and 19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 1/08/2008.

Response to Arguments

3. Applicant's arguments with respect to claims 1-4, 9, 12 filed on 2/23/2009 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 4, 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Manabe et al. (JP 04-063473).

Regarding claim 1, Manabe et al. discloses a CCD color solid-state image pickup device (figure 4) comprising:

a plurality of light-receiving sections (photoelectric converters 30, figures 1-5, and see abstract) arranged on the surface of a semiconductor substrate;

a vertical transfer path (vertical CCDs 20, figures 1-5, and see abstract) by way of which signal electric charges stored in electric charge storage sections of the respective light-receiving sections are read and transferred to a horizontal transfer path; and signal electric charges stored in the respective electric charge storage layers are read independently to the vertical transfer path;

wherein the electric charge storage section of each of the light-receiving sections has a plurality of electric charge storage layers which are formed in a silicon layer and are provided in a depthwise direction of the semiconductor substrate with potential barriers interposed therebetween (figures 1-6, see abstract),

wherein each of the plurality of electric charge storage layers is different in the depthwise direction from the others of the plurality of electric charge storage layers (figure 6, see abstract).

Regarding claim 2, Manabe et al. discloses wherein an electric charge path, which causes electric charges stored in the electric charge storage layers to migrate to the surface of the semiconductor substrate and is formed from a heavily-doped impurity region, is provided in an electric charge storage layer from among the plurality of electric charge storage layers, the electric charge storage layer being provided in the semiconductor substrate (figures 1-6, see abstract).

Regarding claim 4, Manabe et al. discloses wherein the depths of the respective electric charge storage layers are set in accordance with wavelengths of incident light to be detected (figure 6, see abstract).

Regarding claim 12, Manabe et al. discloses wherein the light-receiving sections are arranged in a square solid pattern on the surface of the semiconductor substrate (figure 4).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-4, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Merrill (US 6,930,336) in view of Kobayashi et al. (US 6,750,911).

Regarding claims 1, Merrill discloses a color solid-state image pickup device comprising:

a plurality of light-receiving sections (pixel sensor array 192, figure 13, column 12, line 62 – column 13, line 9) arranged on the surface of a semiconductor substrate;

wherein the electric charge storage section of each of the light-receiving sections has a plurality of electric charge storage layers which are formed in a silicon layer and are provided in a depthwise direction of the semiconductor substrate with potential barriers interposed therebetween (figure 7, column 5, lines 45-54; column 6, line 1 – column 7, line 19),

wherein each of the plurality of electric charge storage layers is different in the depthwise direction from the others of the plurality of electric charge storage layers (figure 7, column 5, lines 45-54; column 6, line 1 – column 7, line 19).

Merrill fails to specifically disclose a vertical transfer path by way of which signal electric charges stored in electric charge storage sections of the respective light-receiving sections are read and transferred to a horizontal transfer path; and signal electric charges stored in the respective electric charge storage layers are read independently to the vertical transfer path. However, Kobayashi et al. discloses an imaging apparatus includes a CCD imager, which comprises a vertical transfer path (vertical transfer 20b, figure 2, column 4, lines 22- 40) by way of which signal electric charges stored in electric charge storage sections of the respective light-receiving sections are read and transferred to a horizontal transfer path; and signal electric charges stored in the respective electric charge storage layers are read independently to the vertical transfer path (vertical transfer 20b, figure 2, column 4, lines 22- 40).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Merrill by the teaching of Kobayashi et al. in order provide, at low cost, an imaging apparatus in which noise is prevented from occurring (column 1, lines 27-29).

Regarding claim 2, Merrill discloses wherein an electric charge path, which causes electric charges stored in the electric charge storage layers to migrate to the surface of the semiconductor substrate and is formed from a heavily-doped impurity region, is provided in an electric charge storage layer from among the plurality of electric charge storage layers, the

electric charge storage layer being provided in the semiconductor substrate (figure 7, column 6, line 1 – column 7, line 19).

Regarding claim 3, Merrill discloses wherein a concentration gradient is imparted such that the dopant concentration of the electric charge storage layers formed as heavily-doped impurity regions and the dopant concentration of the electric charge path continually connected to the electric charge storage layer increase as the electric charge storage layer and the electric charge path approach the vertical transfer path (figure 7, column 6, line 1 – column 7, line 19).

Regarding claim 4, Merrill discloses wherein the depths of the respective electric charge storage layers are set in accordance with wavelengths of incident light to be detected (figure 7, column 5, lines 45-54; column 6, line 1 – column 7, line 19).

Regarding claim 12, Kobayashi et al. discloses wherein the light-receiving sections are arranged in a square solid pattern on the surface of the semiconductor substrate (figure 2).

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over in view of Merrill (US 6,930,336) in view of Kobayashi et al. (US 6,750,911) further in view of Stavely (US 6,535,249).

Regarding claim 9, Merrill and Kobayashi et al. fail to disclose wherein on-chip light gathering optical systems are provided on upper portions of the respective light-receiving sections, and one opening of each light-shielding film corresponds to each of the light-receiving sections. However, Stavely teaches a digital camera optical system which comprises microlens 468 is mounted on the upper portion of electronic sensor 416 for gathering image light 422 and focuses it onto the smaller width 488 of the light sensitive region 454 via an opening of light shields 440, 446, figure 8, column 5, lines 40-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Merrill and Kobayashi et al. by the teaching of Stavely in order to focus and direct image light toward the pixels in an electronic sensor (column 3, lines 18-20).

Allowable Subject Matter

9. Claims 7-8, 15, 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T. NGUYEN whose telephone number is (571) 272-7315. The examiner can normally be reached on 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID L. OMETZ can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. T. N./
05/04/09

/David L. Ometz/

Supervisory Patent Examiner, Art Unit 2622